



**University
Sound Inc.**
a MARK IV company
**COMMERCIAL
SOUND
PRODUCTS**

OPERATING INSTRUCTIONS



MODEL 1800-40 AMPLIFIER

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

DESCRIPTION

The Raymer Model 1800-40 is a monaural solid state amplifier with a power output of 40 watts RMS. This versatile unit is designed for dependable continuous operation in background music, public address, paging and sound reinforcement systems.

This amplifier has provisions for mixing four inputs. They are identified as three microphone inputs and one music input. The three microphone inputs are low impedance balanced. Alternate inputs on these microphone channels are provided as follows: MIC-1 may be changed to balanced line input by means of a switch on the back panel. MIC-2 and MIC-3 will provide a high impedance unbalanced input by using an alternate input jack. MIC-3 channel may be used as an AUX input by means of a selector switch on the front panel.

The MUSIC channel may be input by one of two sources as selected by means of a switch on the front panel. This channel features a MUSIC MUTE circuit which may be used to fade out the music when paging. This Automatic Music Mute feature mutes the Music Channel when a signal is present on any of the microphone inputs. Screw terminals are provided to mute the music by means of a remote switch and/or disconnect the automatic mute feature.

Power output connections are made by means of screw terminals on the back of the unit. Output connections include 4 and 8 ohm for use when making direct speaker voice coil connections, as well as 25 Volt and 70 Volt lines for speaker distribution systems.

The amplifier is housed in a sturdy steel cabinet measuring 13-1/2" x 10-7/8" x 3-7/8" which may be rack mounted by use of the Raymer Model RPK-2 rack mounting kit. The unit operates from a standard 120 Volt

AC 60Hz power source and is protected by a Push-To-Reset circuit breaker which prevents possible damage that might be caused by accidental shorts or overloads.

UNPACKING

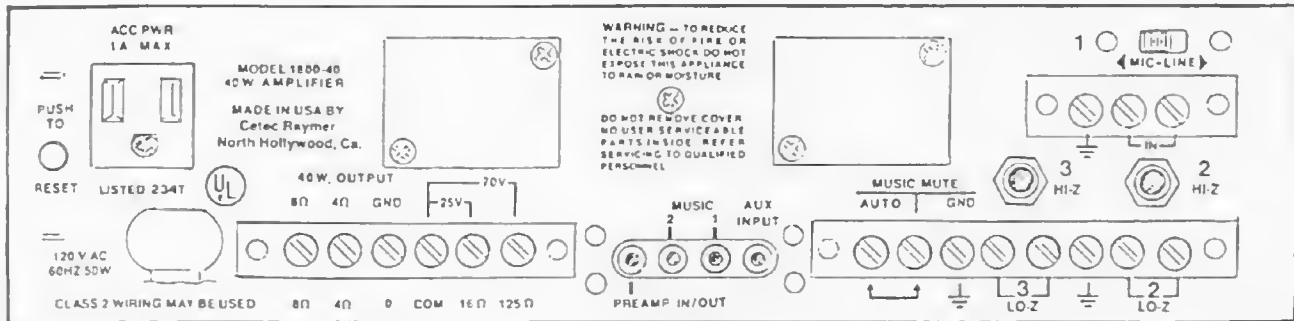
The unit is to be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of any damage which might have occurred in shipment, immediately notify your supplier, or the transportation company which delivered it. Claims for damage sustained in transit must be made up in the carrier. Save all packing material for inspection by the claim agent who will furnish you with the proper forms and will also give you the necessary instructions for filing a claim.

INSTALLATION

Each Raymer amplifier has ample vents for normal cooling by means of air circulation and should be installed in a manner which permits free air flow around the unit. DO NOT PLACE ANY OBJECT ON TOP OF THE UNIT WHICH WILL BLOCK THE AIR FLOW OF THESE VENTS. DO NOT STORE OR OPERATE THE UNIT IN A HOT AREA WHERE THE TEMPERATURE EXCEEDS 140° F.

The unit may be mounted in a standard 19-inch rack by using a Raymer Model RPK-2 rack panel kit. These kit require a vertical height of only 5-1/4".

The power required to operate this unit is 105-120 volts AC 60 Hz. The AC power cord on the unit has 3 prongs and must be connected into a matching 3-wire grounded outlet to provide a safety ground for the receiver. An AC receptacle is provided on the rear panel of the receiver to provide power for accessory equipment. This receptacle is controlled by the POWER on-off switch so that the accessory equipment is turned on and off with the amplifier.



CONNECTIONS

All connections are made on the rear panel of the unit. Output connections are made by means of screw terminals. Output wiring may be connected with unshielded wire. All other wiring requires the use of shielded cable.

Connection to the AUX INPUT, MUSIC 1 or 2 and PREAMP IN/OUT are made by means of a standard RCA type phone jack. These circuits require the use of a shielded audio patch cord with a phono plug.

The low impedance microphone connections are made by means of screw terminals. These inputs are balanced and require the use of two conductor shielded wire. Refer to Fig. 1 for the proper wiring of these inputs.

The high impedance microphone connections are made by means of a 1/4 phone plug. This circuit is unbalanced and requires the use of a single conductor shielded cable.

MIC 1 INPUT

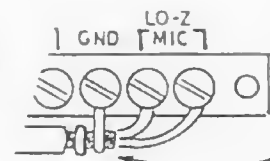
This input is a low impedance balanced circuit which may be used to match either a microphone or line input as determined by the switch located directly above the terminals. With the switch in the MIC position, this input has a sensitivity of 1/2 mv. to match the output of a 150 to 250 ohm low impedance microphone. Because of the high gain of this circuit, care must be taken in wiring this input to prevent oscillation caused by capacitive feedback from the output wiring. Microphone wiring requires the use of a shielded cable with two center conductors. These two conductors should be connected to the terminals marked IN and the shield to the GND terminal. No other wiring should be included inside of the shield and any unused wires in the cable must be grounded to prevent R.F. pickup.

When the switch in the LINE position, this input has a sensitivity of 50 mv. and an input impedance of 1000 ohms. In this position the PAGE input may be used from a phone system as the paging source. The PAGE input may be directly connected to the 600 ohm "paging port" output of registered PABX or switchboard equipment. Such equipment contains the protective circuitry required by the FCC. If a paging output is not available from the telephone equipment, then either the Raymer Model TAP trunk access paging adaptor or the Raymer Model TSA telephone station access paging adaptor must be used to properly match this input to the phone system. UNDER NO CIRCUMSTANCES MAY THIS INPUT BE DIRECTLY CONNECTED TO THE NATIONAL TELECOMMUNICATIONS NETWORK. Input wiring to the receiver from the phone circuit may be made with unshielded wire. However, if this wire is cabled with the output wiring or if oscillation, noise, or R.F. interference is noted, these wires should be shielded and connected as shown in Figure 1.

MIC 2 and MIC 3 INPUT

The low impedance microphone input of these channels is identical to MIC 1 and should be wired as described in that section. The high impedance microphone input is unbalanced and has a sensitivity of 5 millivolts. Input connections to this jack requires the use of a shielded 1/4 inch phone plug.

FIGURE 1.
LOW IMPEDANCE
MICROPHONE
INPUT WIRING.



NOTE:
SHIELD ON
MICROPHONE
CABLE MUST
BE CONNECTED
TO GROUND

MIX 3/AUX INPUT

When a paging source is not from a microphone, the AUX input of the MIC 3/AUX channel may be used. This input is selected by means of slide switch on the front panel directly below the MIC 3/AUX control knob. The AUX input is high impedance with a sensitivity of 1/4 volt. To expand the number of microphones in a system, this input may be connected to the output of a mixer/preamp such as the Raymer Model 1004.

MUSIC INPUT

The MUSIC input is high impedance with a maximum sensitivity of 1/4 volt to match the output of a tuner, tape player or other audio equipment with a line level output. Two input jacks are provided to allow different music sources. Selection of the music source is made by means of a slide switch on the front panel located directly below the MUSIC control knob.

MUSIC MUTE

Screw terminals are provided on the back panel to mute the music when paging. Music mute may either be manual or automatic according to the connection of these terminals. The AUTO and MUSIC MUTE terminals are jumped together at the factory to activate the automatic Music Mute feature. If this feature is not desired, disconnect the jumper. To mute the music by means of a switch closure, connect the switch circuit from MUSIC MUTE to GND. The music mute will be muted when there is a short circuit between these terminals.

PREAMP IN/OUT

This jack provides access to the mixer bus which is the circuit in the amplifier that connects the output of the preamplifier to the input of the power amplifier. Anything connected to this circuit must be high impedance to prevent shorting out the page and music. This jack may be used as an output to drive the input of a tape recorder or another amplifier. When used as an input, the source may be from a Raymer Model TGSP-4 to provide a chime annunciator signal or alarm tone. The Raymer Model TRG tone ringing generator may be used for loud telephone ringing requirements such as a night bell. By connecting a signaling or alarm signal in this manner, it is unaffected by the front panel controls.

OUTPUT CONNECTIONS

40 watts RMS power output is provided for 4 or 8 ohm speaker lines or for distribution on 25 volt or 70 volt lines. Output connections are made by means of screw terminals on the back of the unit.

Long speaker lines have an appreciable resistance with resulting power loss. To avoid this power loss, the use of matching transformers on either 25 volt or 70 volt lines is recommended. This arrangement also allows the connection of multiple speakers which have different power requirements. In all cases it is advisable to run as heavy a wire as possible consistent with requirements. To avoid inducing hum into the speaker lines do not run speaker cables parallel to power line cables.

In some areas 70 volt distribution lines must be run in conduit. Check your local city electrical codes before installing a 70 volt speaker system to determine the local code requirements.

The 4 OHM and 8 OHM outputs are used when connecting directly to speaker voice coils. When a speaker or a series-parallel array of speakers with an impedance of 8 ohms is connected to the amplifier output, use the terminals marked 8 OHMS and GND. Use the terminals marked 4 OHMS and GND for a speaker circuit with a 4 ohm impedance. Do not simultaneously load both outputs at their rated impedance as this will appear as a demand for

twice the rated output from the amplifier and represent an overload to the unit. In a similar manner, do not load both the speaker output and the 25 or 70 volt output simultaneously at full power demand. A combination of speaker loads is permissible using the various outputs from the amplifier; however, the sum of these demands should not exceed the rated power output of the amplifier.

The 25 VOLT and 70 VOLT outputs are used with speaker distribution systems in which each speaker has a line matching transformer which is connected for the specific wattage requirement of that speaker. This permits the use of a large number of speakers with various sound level requirements to operate from a common source. By rating these transformers in the wattage which they demand across a 25 volt or 70 volt line, there is no necessity in calculating total impedance. The total wattage demand of such a speaker line may be determined by adding up the sum of all the speaker demands in the system. This total should not exceed the wattage rating of the amplifier used to drive the system. Connection to the 25 volt or 70 volt outputs is made by means of screw terminals on the face of the unit, use the terminals marked COMM and 25V (or 70V) according to the line desired.

Optimum performance of any amplifier depends upon proper impedance match between the output and the load. Connecting a load of mismatched impedance to an amplifier will deteriorate the overall performance of the system. To accurately measure the impedance of a speaker line, the Raymer Model LWT should be used. This test instrument permits direct reading of the wattage demand or impedance of a speaker line and is a valuable aid in determining opens, shorts or mismatch conditions.

The circuit breaker located on the rear panel protects the unit from drawing excessive AC line current which could cause damage to the internal components.

IN THE EVENT THAT THE CIRCUIT BREAKER CONTINUES TO TRIP, DO NO ATTEMPT TO DEFEAT THE FUNCTION OF THE CIRCUIT BREAKER. HAVE THE TROUBLE INVESTIGATED BY A QUALIFIED TECHNICIAN OR RETURN THE UNIT TO THE FACTORY.

Warranty: These units have been very carefully inspected and are warranted to be free from defects in material and workmanship under normal use and service for a period of one year from sale to original purchaser. This warranty does not extend to any unit that has been subject to abuse, misuse, neglect, accident, improper installation, or alterations. The obligation of University Sound under this warranty is limited to the repair of any defect in material or workmanship and/or the replacement of any defective part, provided the unit is returned transportation paid within one year. It is recommended that any unit on which service is required be processed through your local distributor or installation company wherever possible. This Warranty is expressly in lieu of all other Warranties, expressed or implied, and of all other obligations or liabilities on our part. We neither assume for us any other liability in connection with the products manufactured by University Sound.

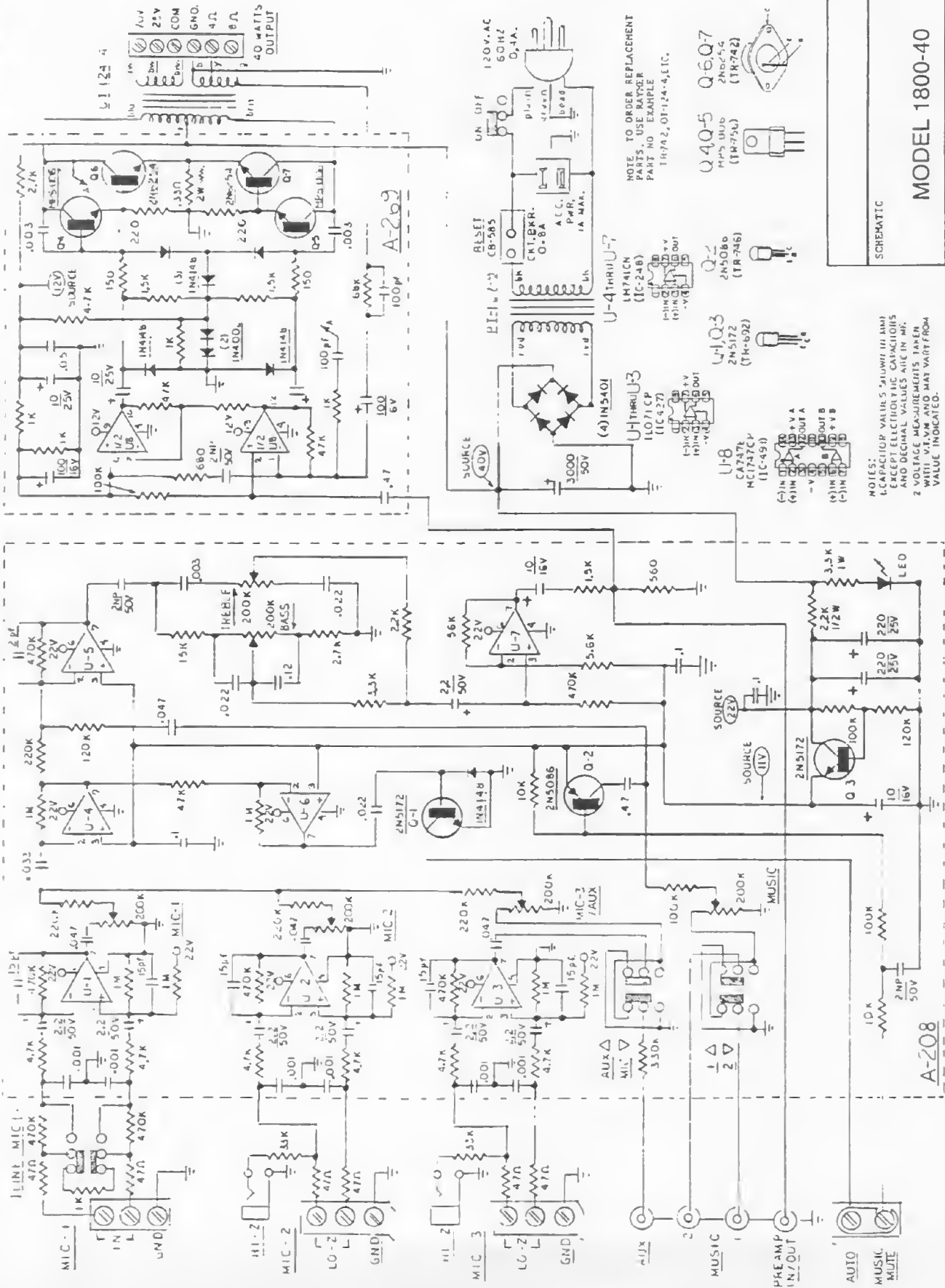
MANUFACTURED IN THE USA BY



**University
Sound Inc.**
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PRODUCTS**

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NOTE: PARTS AND CIRCUIT SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT PRIOR NOTICE



SCHEMATIC

MODEL 1800-40

ENGINEER: C. KOCHE DATE 12-4-60

NOTE: TO ORDER REPLACEMENT PARTS, USE RAYCOE PART NO. EXAMPLE: 1H7A2, 0T124-4, ETC.

U40-5 Q60-7
2N5086 (1H7A2)
2N5086 (1H7A2)

U40-3 Q2-2
2N5172 (1H7A2)

U1-8 Q1-1
2N5172 (1H7A2)

U1-3 Q1-2
2N5172 (1H7A2)

U1-4 Q1-3
2N5172 (1H7A2)

U1-5 Q1-4
2N5172 (1H7A2)

U1-6 Q1-5
2N5172 (1H7A2)

U1-7 Q1-6
2N5172 (1H7A2)

U1-8 Q1-7
2N5172 (1H7A2)

U1-9 Q1-8
2N5172 (1H7A2)